

We claim:

1. An injection system for injecting a fluid from a syringe into a patient comprising:
 - a container;
 - a pump arranged to introduce fluid into and express fluid out of the container;
 - a controller adapted to operate said pump in a charging mode in response to an operator command, wherein said pump is advanced to an empty position and then the piston is retrieved to a full position with said tube extending to a fluid source thereby causing fluid from the fluid source to fill said container.
2. The system of claim 1 wherein said controller is adapted to advance said piston after said container has a predetermined amount of fluid to purge air.
3. The system of claim 1 further comprising a valve coupled to said tube and arranged to allow fluid to be ejected from the syringe in a first position, and fluid to flow into the syringe from the fluid source on a second position.
4. The system of claim 1 wherein said container is a syringe.
5. The system of claim 1 wherein said controller defines an aspiration mode during which said piston is at least partially retrieved to cause fluid to flow toward said piston.
6. The system of claim 5 further comprising a selector controlled by an operator to indicate a desired mode of operation, wherein said controller selects said aspiration mode in response to a position of said selector.

7. The system of claim 6 wherein said selector is adapted to indicate an aspiration operation, and wherein said controller is adapted to move said piston back by a predetermined distance, stop said piston and then move said piston forward again, thereby causing fluid to flow back from the patient and then forward into the patient.

8. The system of claim 7 wherein during said aspiration operation, wherein said controller is adapted to move said piston to the position at which the aspiration operation has started.

9. The system of claim 5 wherein said controller is adapted to select the aspiration mode at the end of an injection, wherein during said aspiration mode said piston is moved back by said controller by a sufficient amount to retrieve fluid from said syringe.

10.. An injection system for injecting a fluid from a syringe into a patient comprising:

a container;

a pump arranged to introduce fluid into and express fluid out of the container;

a selector used to generate an operator command, said selector, having an On position and an OFF position different from said ON position;

a controller adapted to operate said pump to express fluid from said container when said selector is in said ON position, and to stop fluid flow when said selector is in the OFF position.

11. The injection system of claim 10 wherein said selector has an ON1 position, an ON2 positions, an OFF1 position, and an OFF2 position, and wherein said controller operates said pump in different modes for each selector positions.

12. The injection system of claim 11 wherein said selector is adapted to move in a continuous fashion between two extremes, with said ON1, ON2, OFF1 and OFF2 positions are defined between said two extremes in accordance with a hysteresis curve.

13. The injection system of claim 11 wherein said controller is adapted to operate said pump at a first speed when said switch is at said ON1 position, and a second speed when said switch is in said ON2 position.

14. The injection system of claim 10 wherein said switch is an air-activated switch.

15. The injection system of claim 14 wherein said switch comprises a bellows and a pressure sensor coupled to said bellows.

16. The injection system of claim 15 wherein said switch further comprises a foot pedal activating said bellows.